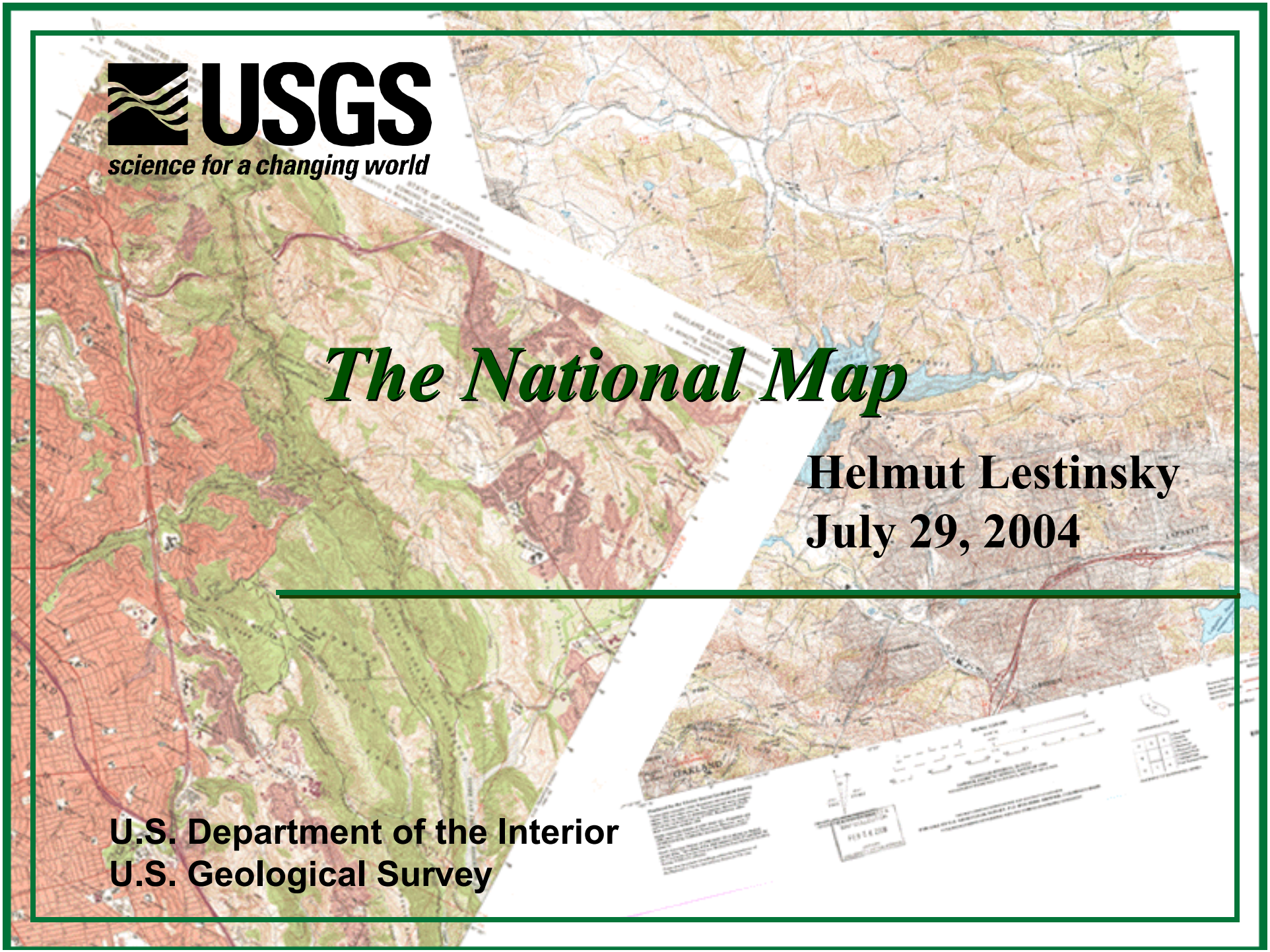


The National Map

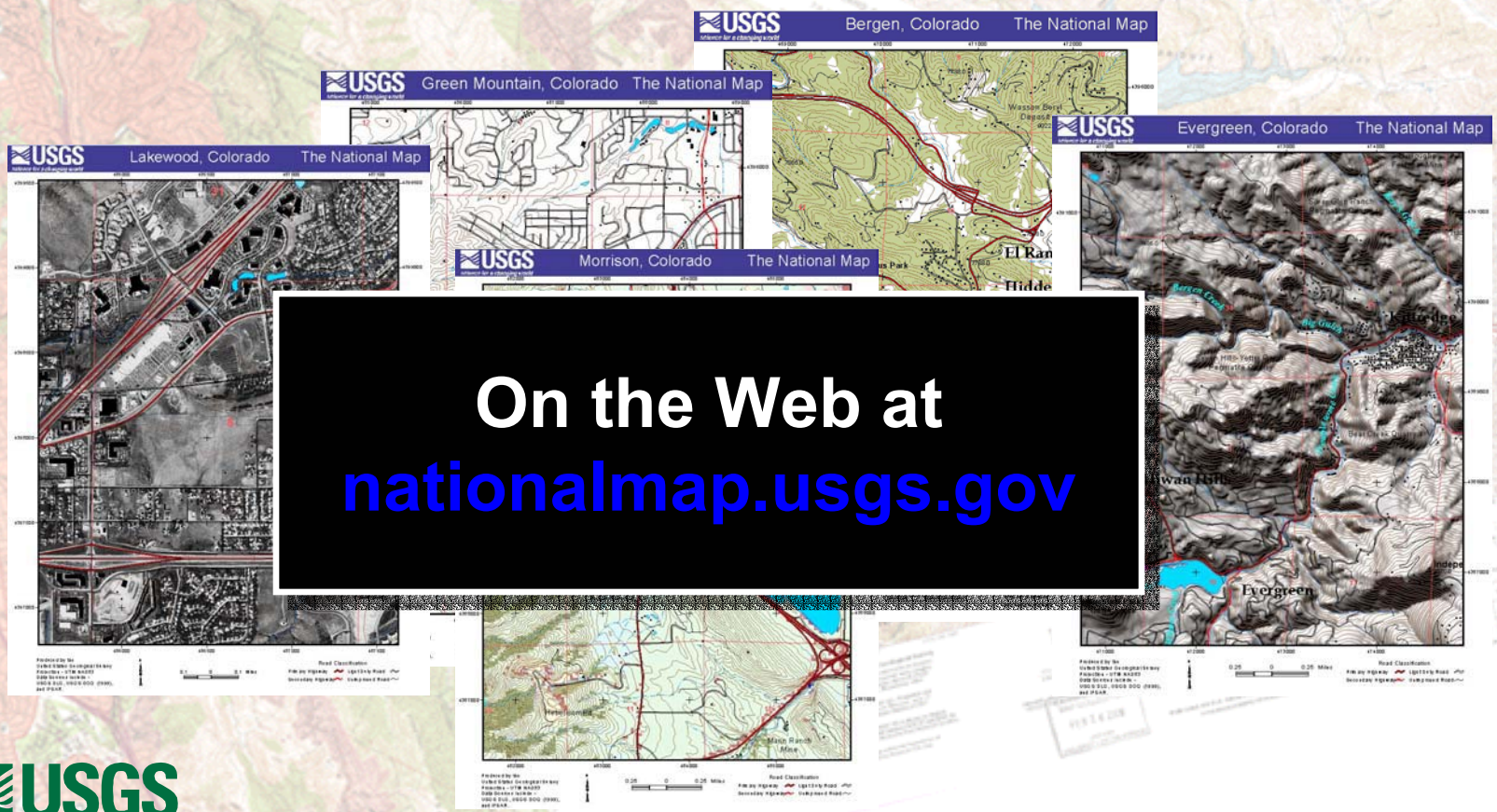
Helmut Lestinsky

July 29, 2004

U.S. Department of the Interior
U.S. Geological Survey

The National Map

- America's topographic map for the 21st century
- *Unleashing the power of geographic science*



USGS

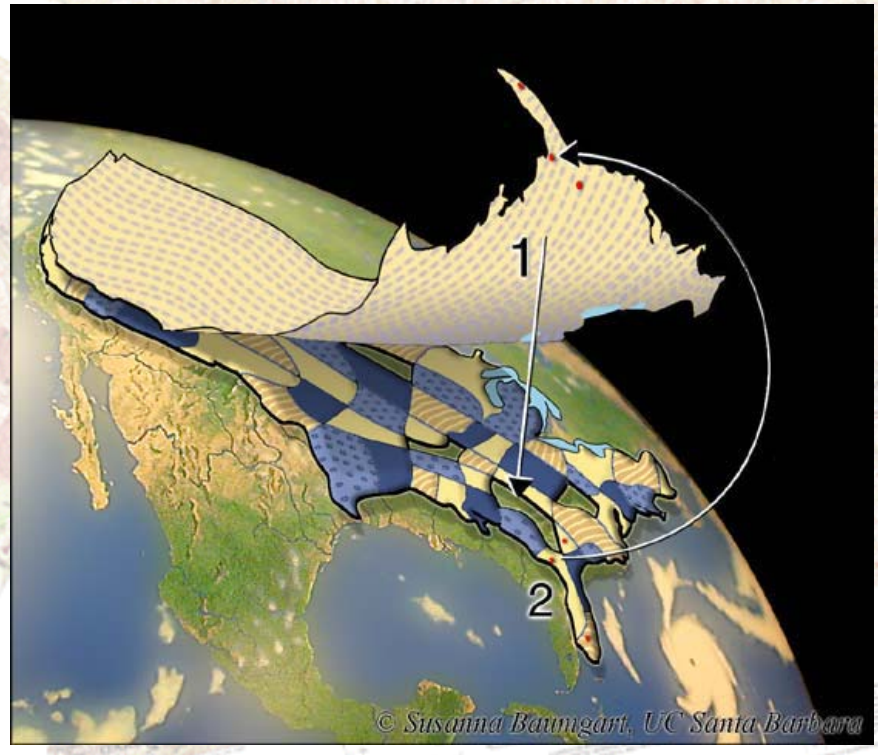
The National Map: Data Themes

- Orthorectified Imagery
- Land cover
- Elevation
- Vector layers:
  - Transportation
    - Roads (Sources: Census, State/local, private)
    - Other
  - Hydrography
  - Structures
  - Boundaries
    - Legal/"political" (Sources: Census, State/local)
    - Administrative
- Geographic names

USGS

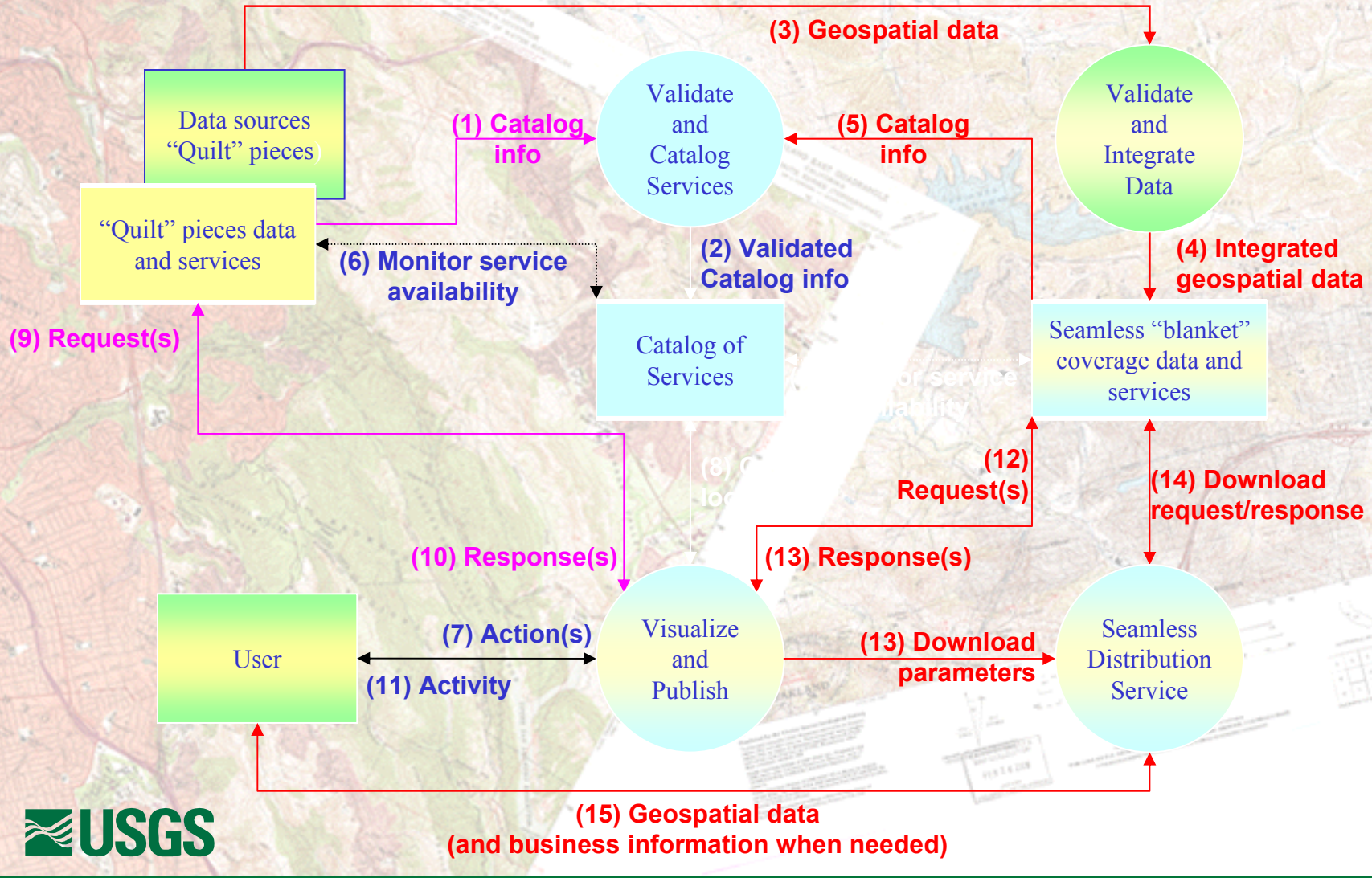
The National Map: Blankets and Quilts

- **Blanket: Uniform coverage and characteristics.**
- **Quilt: Patches of detailed data having somewhat varying characteristics; "some assembly required".**



USGS

The National Map:
Current "Conceptual" Data Flows

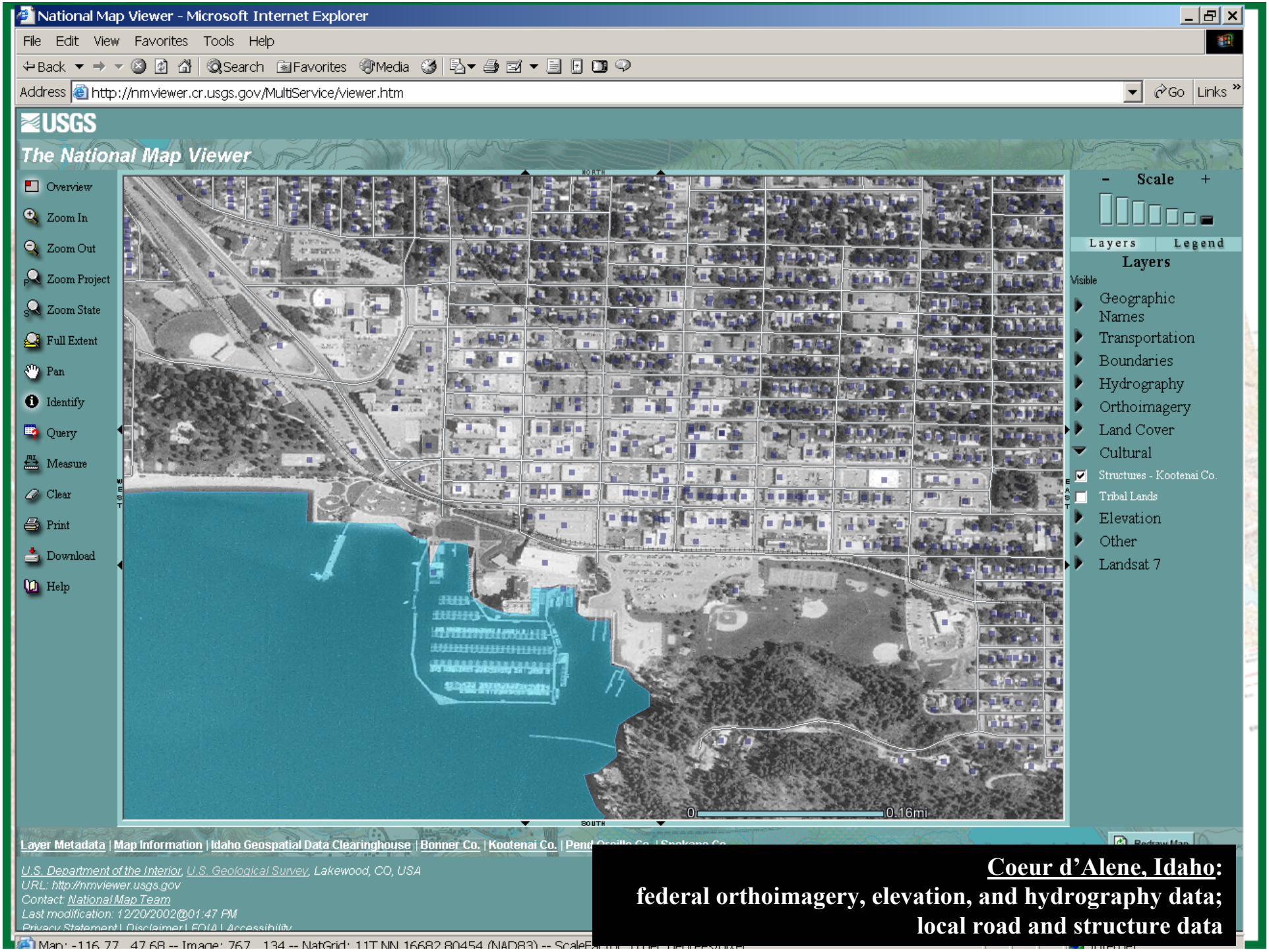


USGS

Nationally Consistent Data Sets

- National Elevation Dataset
  - Learn more at http://gisdata.usgs.gov/ned/default.asp
- Orthoimagery
  - Learn more at http://www-wmc.wr.usgs.gov/doq/
- National Hydrography Dataset
  - Learn more at http://nhd.usgs.gov
- Geographic Names Information System
  - Learn more at http://geonames.usgs.gov
- National Land Cover Dataset
  - Learn more at http://landcover.usgs.gov
- *National Atlas of the United States*
  - Learn more at http://www.nationalatlas.gov

USGS



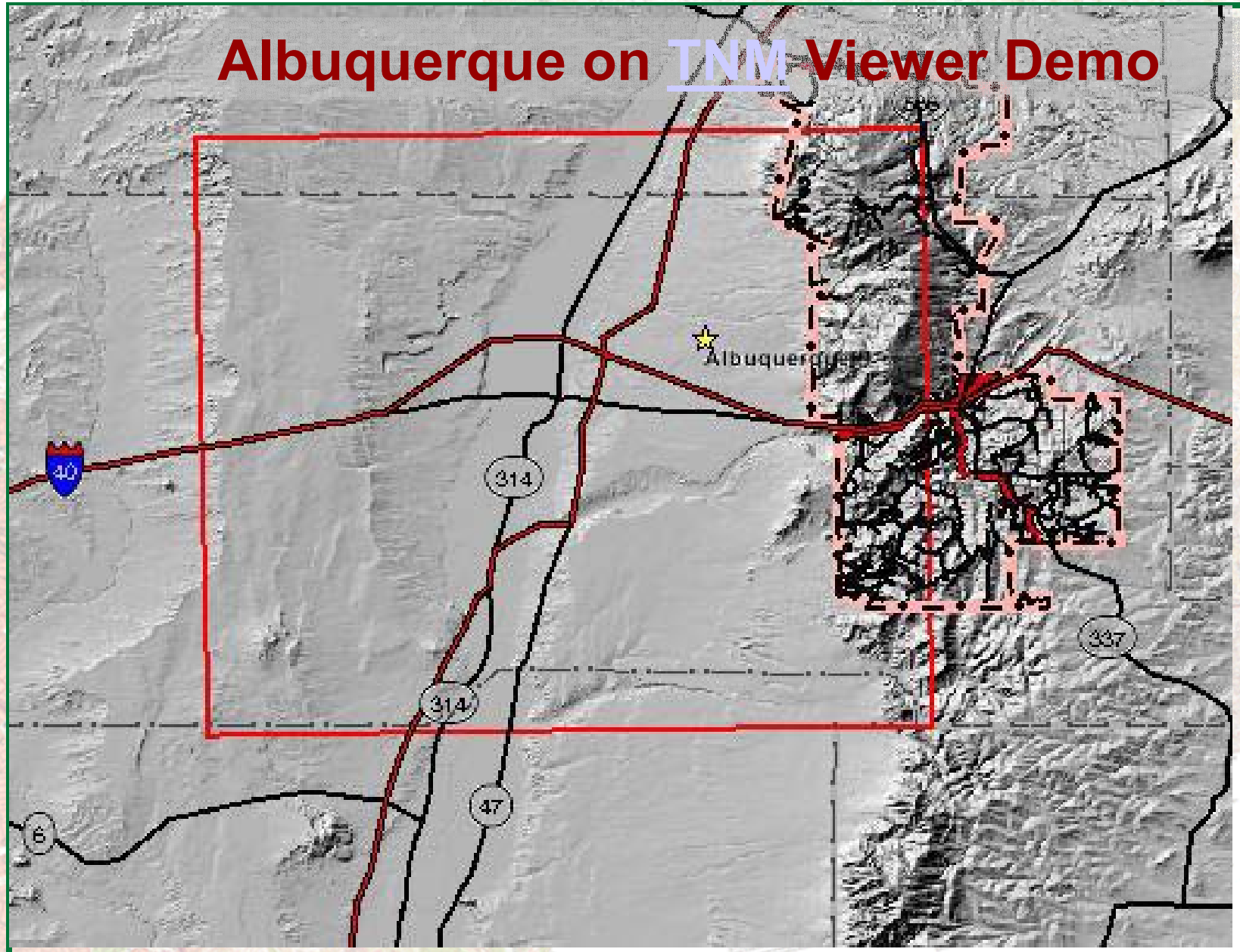
Coeur d'Alene, Idaho:
federal orthoimagery, elevation, and hydrography data;
local road and structure data

USGS/USFS *The National Map* Pilot

- Joint effort is foundation for establishing a long-term partnership for the Forest Service to contribute to ***The National Map.***
- Utilizes large data holdings over NFS lands, and reduces duplication of effort in gathering data over NFS lands.
- Effort will help determine how the Single Edition Program will be incorporated into ***The National Map.***
- USFS has set up web mapping service for access to FS data through WMS in Fort Collins.
- Non-FS data served through USGS ***NM*** WMS.
- Each agency, where appropriate, will coordinate with partners to acquire local data.

USGS

Albuquerque on TNM Viewer Demo



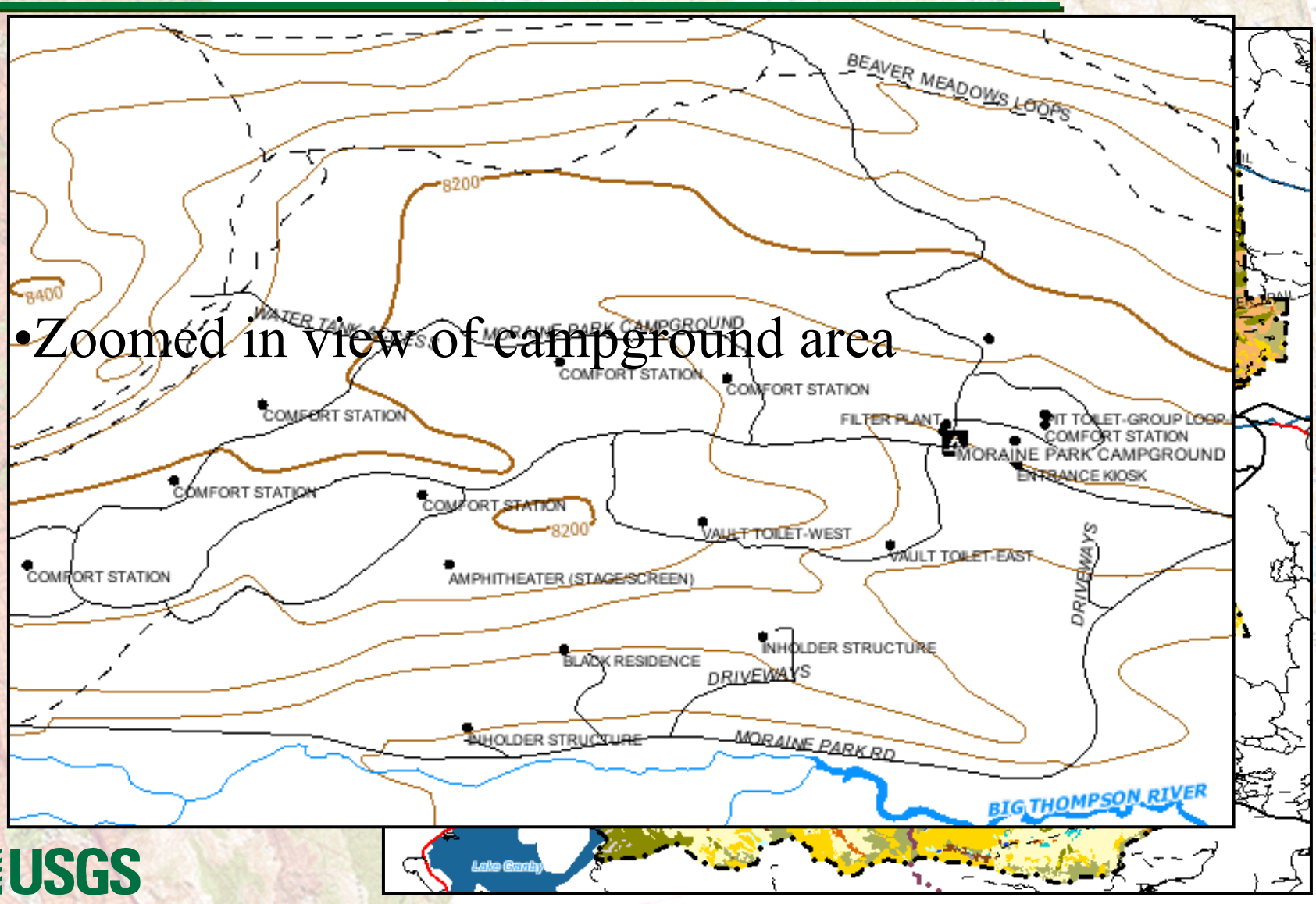
USGS

USFS / USGS issues

- Determine policy for “what to revise and what not to revise” – who does what
- Edge matching and data overlap
- Finalize names and GNIS procedures
- Symbology (on web and hardcopy)
- Website graphic production
- Joint agency coordination with the National Park Service

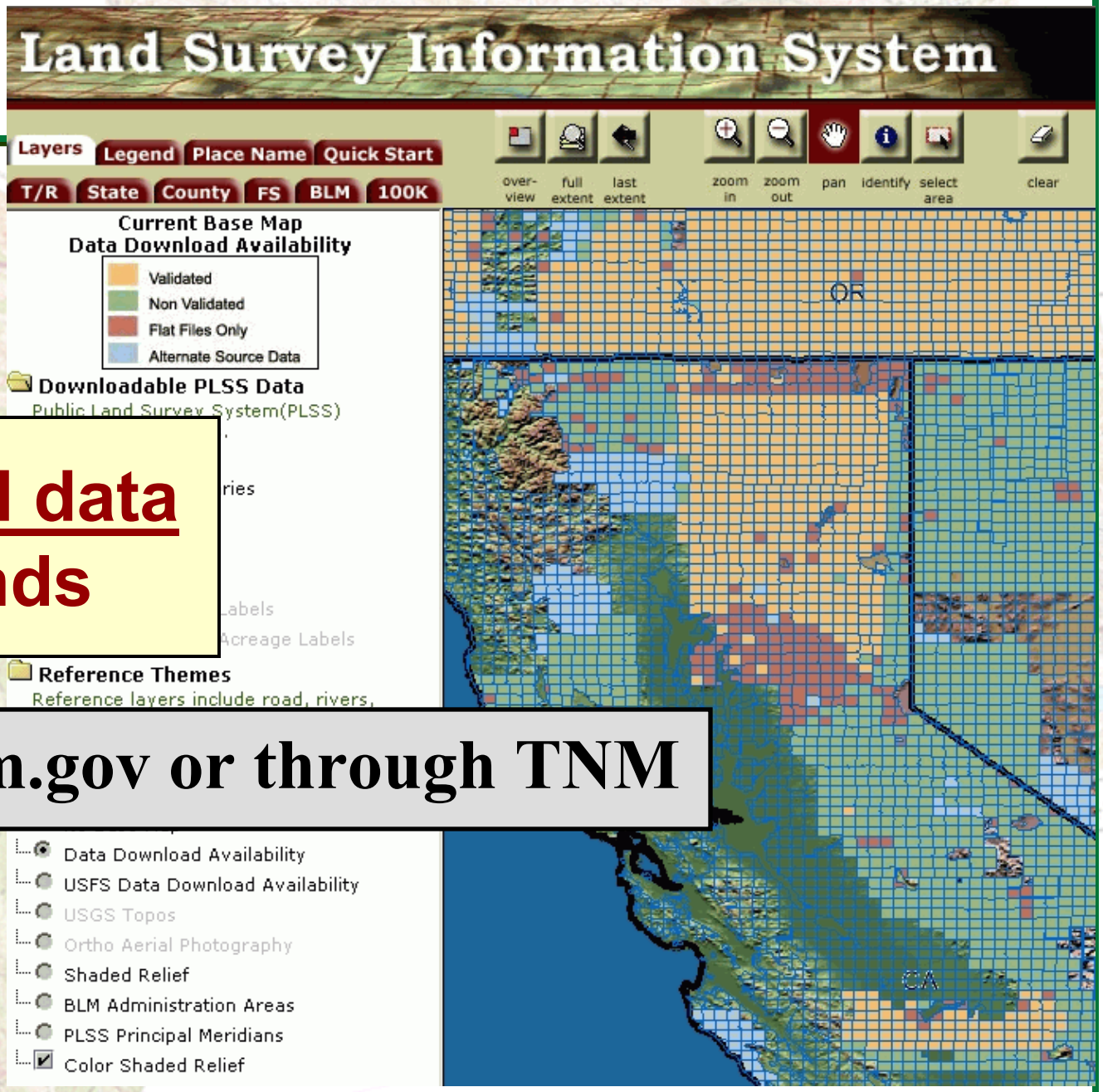
USGS

Rocky Mountain National Park Pilot



- Zoomed in view of campground area

USGS



Other TNM data
Public Lands

www.lsi.blm.gov or through TNM

USGS

Structures layer background

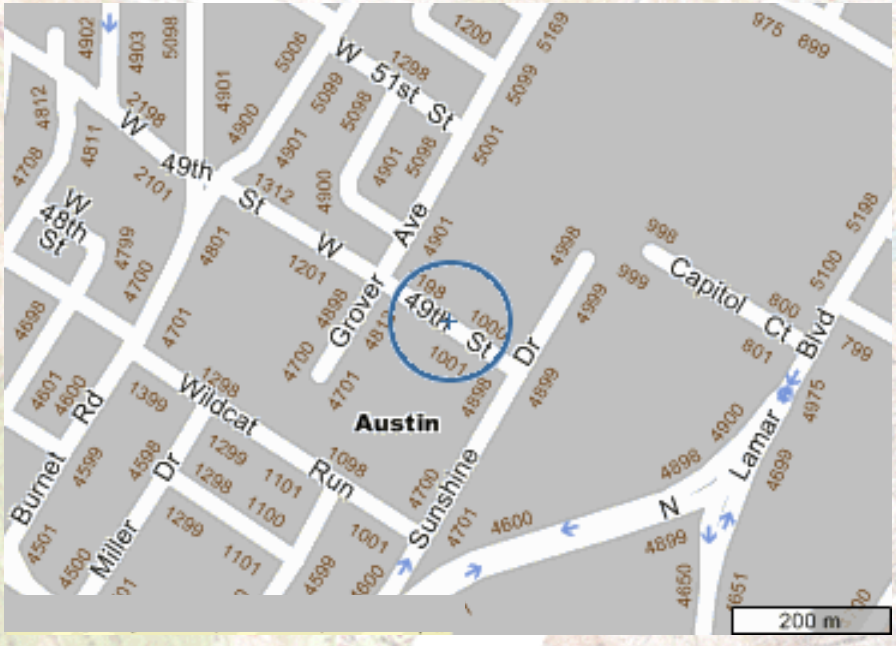
- There is a need to acquire critical infrastructure data sets for Homeland Security purposes
- Hospital Preparedness File owned by Texas Department of Health (TDH)
  - 577 hospitals
  - Geocoded locations
  - Variable accuracy
- Goal: To improve the positional accuracy of the data

USGS

USGS science for a changing world

Geocoding

Process of assigning latitude and longitude to an address



1100 W 49th Street, Austin TX 78756
gets converted to
30.8215N (Latitude) and –97.735514W (Longitude)

USGS

USGS
science for a changing world

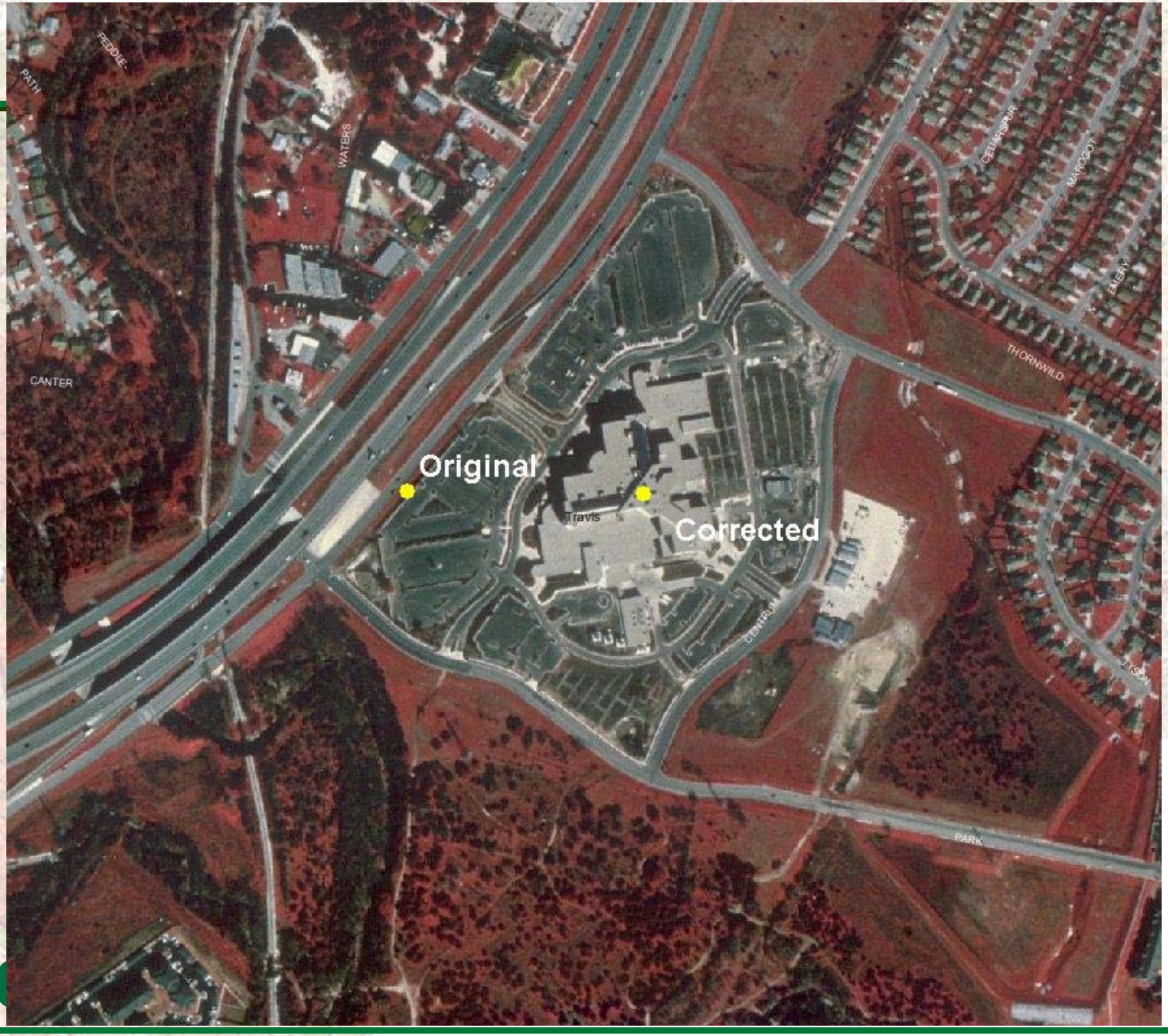
Editing/Review Process:

- View hospital data and Digital Ortho Quarter Quads (DOQQs) in ArcMap
- Zoom in to each hospital
- Move to correct location

USGS

USGS
science for a changing world

North Austin Medical Center, Austin



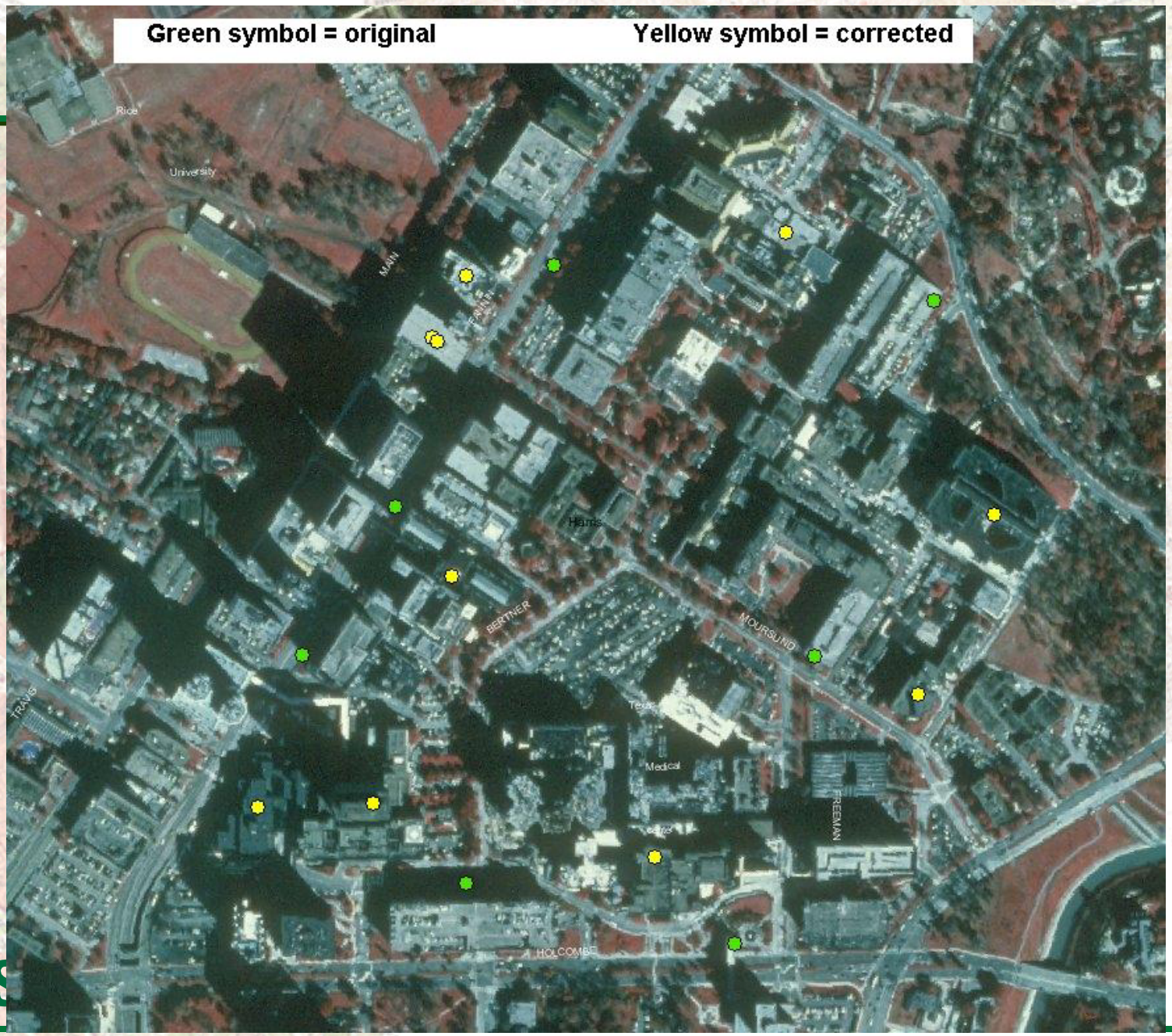
Problems encountered:

- Unable to locate hospital on DOQQs
  - Cluttered urban areas
  - Hospitals constructed recently
- Address data not complete or inaccurate
  - Misspelled street name
- Street reference data quality issues
  - Incomplete
  - Incorrect

USGS

USGS
science for a changing world

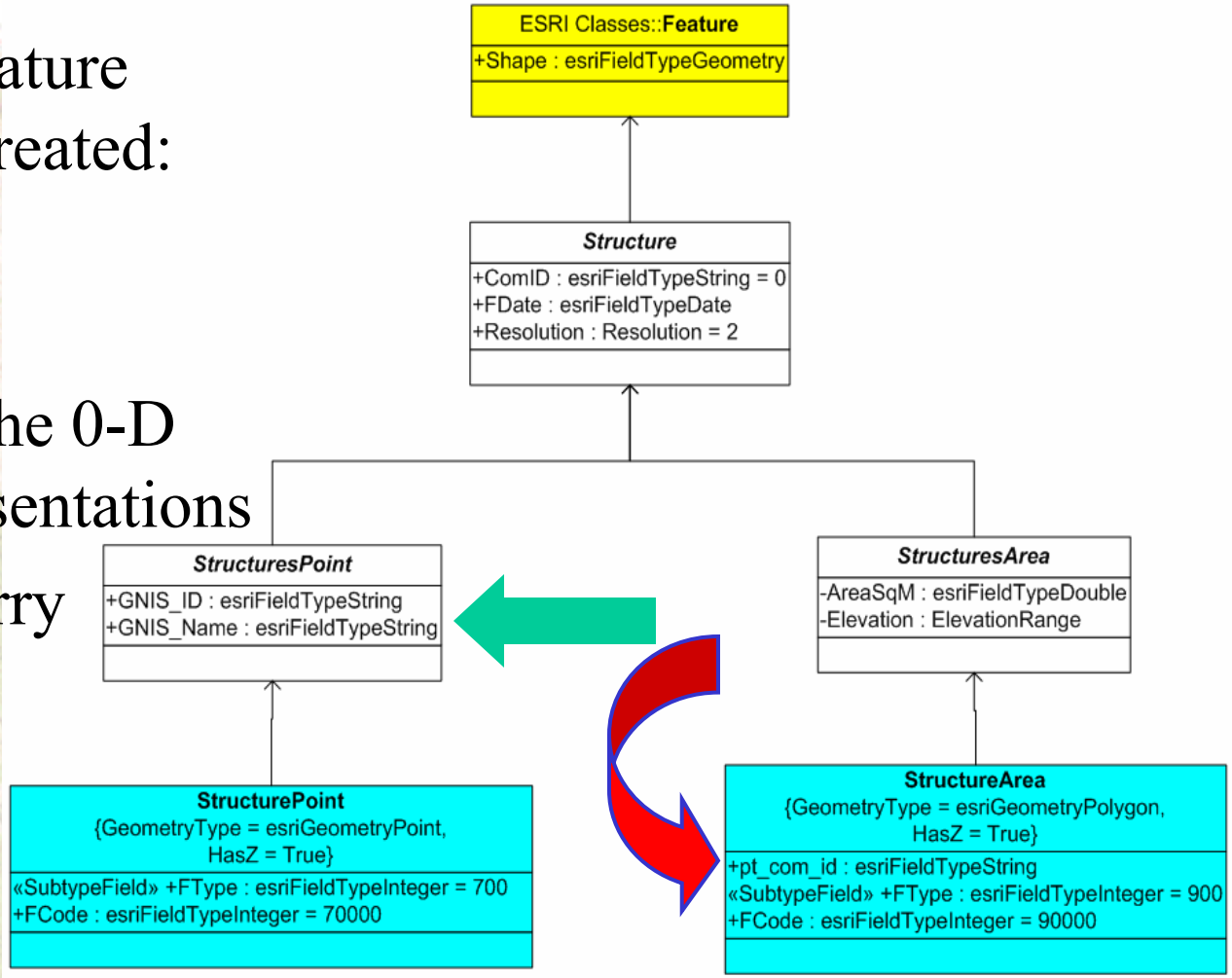
Texas Medical Center, Houston



Fisher County Hospital District, Rotan

Structure Model Feature Classes

- two generic feature classes were created:
  - points
  - areas
- link between the 0-D and 2-D representations
- only points carry GNIS_ID and GNIS_Name



USGS

FEMA Data (EF, HPLF, TRAN, UTIL, BOUN)

- Medical Care (Hospitals)
- Emergency Operations
- Schools
- Fire Stations
- Police Stations

- Airport
- Bus
- Ferry
- Highway (Bridge, Segment, Tunnel)
- Light Rail (Bridge, Facility, Segment, Tunnel)
- Port
- Railway (Bridge, Facility, Segment, Tunnel)
- Airport Runways

- Dams
- Levees
- Nuclear Power Plants
- Hazardous Materials Sites
- Military

- Communication
- Electric Power
- Natural Gas (Facility, Pipeline)
- Oil (Facility, Pipeline)
- Potable Water (Facility, Pipeline)
- Waste Water (Facility, Pipeline)

- Demographic Data based on County, Block and Tract
- **SEE NOTES PAGE**

USGS

Transportation geodatabase

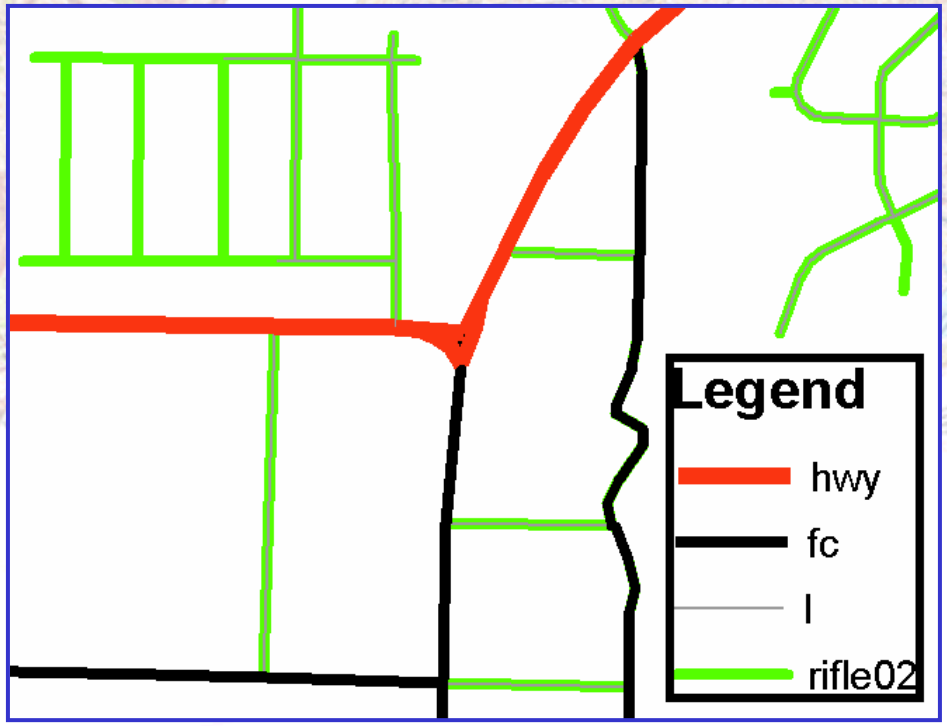
- Use Canadian Model
- Load Census data

USGS

CDOT and Roads

- Start with CDOT database
- Use local data to conflate spatials to CDOT database
- Add new roads
- CDOT roads become a snapshot of county/local roads
- New updates periodically supplied from locals to CDOT
- Motivation: funding is based on road miles
- Eventually, CDOT roads rolled into National Map

- ✓ Garfield County / CDOT / USGS pilot
- ✓ Spatial transfer of local road geometry to CDOT attribution and format



USGS

Census gathers, evaluates and improves data

Census HQ Source Data Collection Procedures

File Evaluation at HQ

- 110 – point collection
- evaluation and re-evaluation

ROs acquire potential geospatial information (via telephone interviews and internet searches) and enter findings into TED

Local Entity

Local Entity

Local Entity

Local Entity

Local Entity

USGS

Files that passed the file accuracy evaluation are delivered to Harris for TIGER accuracy improvement:

- **TIGER/Line file**
- **Local source files and associated instructions**
- **metadata**

southbound

Census gathers, evaluates and improves data

Harris adjusts road centerlines and selected features and delivers to HQ

northbound

Evaluation of Harris-adjusted files at HQ
a series of checks are made to validate the accuracy

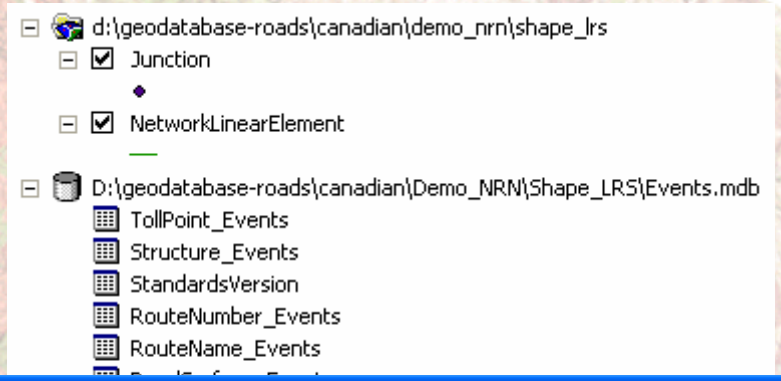
If successful,data is uploaded into TIGER

ROs disseminate the CE-95 evaluation report and a local edition TIGER/Line file to data providers

USGS

Canadian Road Model

- **Only 2 feature classes: lines & points**
- **Everything else is an event**



Attributes of NetworkLinearElement

OBJECTID	NID	FromJuncti	ToJunction	ClassType	DataSetNam	SHAPE_Leng
1	3bb363321a7f48dab0e812f535450913	24f661b63d6d44adb5b9275e54f0da5e	131e22700d554097837b13718eb51549	1	7	0.029533
2	a10a2258b5924219ac9ded722f2826f2	fcf7cdb5d7f64b2aa06fa7f37668e5bd	c292a3ca8f8b46d1a8443ad9ab1da99f	1	7	0.029539
3	a1af2f97b06b47259b78a4e60af40ac3	6bc0fee9fc884f44ac651ab33a3584f2	32c10a50642a4a379bd6f9f0d1624c02	1	7	0.022824
4	3620100ca0554eb9a1eac322e25fdefd	485c613548d64668b7e4d8650cd350d7	84f5af2fde5c4d2886857124008d57bc	1	7	0.002186

Attributes of RouteNumber_Events

FK_NID	NID	FromPlanimetricMeasure	ToPlanimetricMeasure	RouteNumber
0108fe1114cb462ba6142519e49b8540	c2e3a1d8331f41f49bd9da126264cf9f	0	100	1A
0139fa78bf3f497c9eccdc1eb7f99b9b	29b6f91de177490ca7564e5506f0a060	0	100	1A
02364717be9548d18269aea97876b97f	d2c605deac404be08a4ca423121016d3	0	100	250
02720dcf8cbe4bd0a3910abc0bc8d92d	2fccf6c206c843d8adde69f94c51d5dc	0	100	10
02746c9e19ae4f9e9f3342e657889828	017c665b84be4ec0babc90b1db92fe49	0	100	453
02860708ecaf45deb722fb91b7aec0f4	cb5a4f18be1043dd8941f692f24663f6	0	100	24

USGS